

UNIVERSITY OF LOUISIANA AT LAFAYETTE

FALL, 2009

Chemistry 232 - Organic Chemistry II

Class: MWF 10:00 - 10:50 AM, Montgomery MY 230

Instructor - Dr. A. A. Gallo; gallo@louisiana.edu
Office, Montgomery 203 or 235,246

Office Hours - M,W,F 11:00 - 12:00
T 10-11:30 and 2:15-3:45
W 1-2
R 10-11:30 and 1:30-3:00 p.m.
F 1:00 - 2:00 p.m. and by appointment

Text - Organic Chemistry, by Janice Gorzynski Smith, 2nd Ed.
McGraw Hill, 2008
Supplemental- 1) Student Study Guide/Solutions Manual
by Janice G. Smith and Erin R. Smith
2) Organic Learning Center:
www.smithorganic.com
3) Organic Chemistry Study Cards by DeGraff,
DeGraff and Prince Morton Publishing Co.

Attendance: You are encouraged to attend each lecture.
Attendance will be taken periodically. Attendance is
mandatory on examination days.

General Objectives - Organic Chemistry II is a continuation of Organic I. The theory and concepts you learned in Organic I will be the foundations for this course. You may need to review substitution (chapter 7) and elimination reactions (chapter 8), alcohols (chapter 9) and alkene chemistry (chapter 10). This semester we will emphasize dienes and radicals, spectroscopy, aromatic chemistry and carbonyl group reactions and transformations. It is important that you understand mechanistic pathways and synthetic methodology and be able to apply them to problem solving situations. Please pre-read all chapters, work as many homework problems that you can, and ask questions. Seek help from me or a tutor or the website when you do not understand a topic. Set aside time each day (at least 1-2 hours), for working problems and reviewing theory.

Examinations: There will be three one-hour exams and one final (comprehensive) final exam. The final exam will be equivalent to an hour exam or will be counted twice, whatever way is best for the student. This means the final exam is worth 25% or 40% of your overall grade, whatever is best for you. Class assignments and quizzes will be given and will count toward your final grade. There will be no make-up exams! If you miss an exam, see me upon returning to school and we will determine what to do for the missed exam. ***This class is under a strict honor code. Students may not give or receive information during exams. If they do, this warrants a grade of F in the course.***

Standard scale as follows:

A: 90-100%

B: 80-89%

C: 70-79%

D: 60-69%

F: Below 59%

*Depending upon the class average, a slight adjustment may be administered. This adjustment is usually not more than ~ 2%.

CHEMISTRY 232 - FALL, 2009

TENTATIVE SCHEDULE

August 24,26,28..... Introduction & Chapter 11

August 31 & Sept 2..... Chapter 12

September 4,9 & 11.....Chapter 13

September 11,14,16,& 18.....Chapter 14

September 21,23,28.....Chapter 15

****SEPTEMBER 25****.EXAM 1

September 30, October 5,7.....Chapter 16

October 7,9, & 12.....Chapter 17

October 12,14,16 & 19.....Chapter 18

October 21,23.....Chapter 19

October 26,28.....Chapter 20

****OCTOBER 30****.....EXAM 2

November 2,4,6.....Chapter 21

November 9,11,13,16.....Chapter 22

November 18 & 20.....Chapter 23

**** NOVEMBER 25****.....EXAM 3

November 23,30.....Chapter 24

December 2,4.....Chapter 25

****THURSDAY, DECEMBER 10, 2:00-4:30PM.....Comprehensive Final Exam****

EMERGENCY EVACUATION PROCEDURES

A map of this floor is posted near the elevator marking the evacuation route and the Designated Rescue Area. This is an area where emergency service personnel will go first to look for individuals who need assistance in exiting the building. Students who need assistance should identify themselves to the teaching faculty.

Tentative List of topics to be covered in CHEM 232, Organic Chem II
Fall, 2008 and Spring, 2009 in ORGANIC CHEMISTRY, 2nd. Ed. By Smith (McGraw Hill, 2008).

Oxidation and reductions including oxidizing and reducing agents, epoxidation, oxidative cleavages, ozonolysis and alcohol oxidations using Cr reagents.

Spectroscopy and EM Spectrum

Infrared spectroscopy (IR)

Theory, functional group analysis and interpretation

Mass Spectrometry (MS)

Theory, fragmentations, isotope effects, nitrogen rule and interpretation

Nuclear magnetic resonance (NMR)

Theory, mathematics, and NMR active nuclei

First order spectra for ¹H NMR

Number of peaks, peak positions, intensity and splitting patterns

Spin-spin splitting and structure identification and interpretation

¹³C NMR

MRI

Radicals and radical reactions involving halogenation of alkanes and alkenes.

Radical addition reactions (HBr and RSH)

Polymers and polymerization reactions

Conjugation, Resonance and Diene chemistry

1,2 vs. 1,4 additions

Kinetic vs. thermodynamic control

Diels-Alder reaction, theory and synthesis

Benzene and aromaticity

Benzene structure, nomenclature, and stability

Huckel's rule for aromaticity

PAH and Heterocyclic aromatic compounds

Electrophilic Aromatic Substitution Reactions

Mechanisms, Reactions

Substituent effects on reactivity and orientation of EAS reactions

Side chain reactions, oxidations and reductions

Multistep syntheses

Carboxylic Acids

Structure, nomenclature, spectroscopy, preparations and reactions

Carbonyl Chemistry

Organometallic reagents, oxidation and reduction reactions, retro synthetic analysis using Grignard reagent chemistry

Aldehyde and ketones

- Nucleophilic addition reaction theory
- Spectroscopy
- C based Nu and Wittig reaction
- N based Nu and imines and enamines
- O based Nu and acetal chemistry

Carboxylic acids and derivatives

- Nucleophilic acyl substitution theory
- Acid chlorides, anhydrides, esters and amides
- Preparations, reactions, and interconversions
- Spectroscopy
- Synthesis
- Biochemistry

Enol and Enolate chemistry

- Structure, acidity, alpha carbon reactivity
- Halogenation
- Alkylations
- Malonic and acetoacetic ester syntheses

Carbonyl condensation reactions

- Aldol
- Crossed and directed aldol
- Claisen
- Crossed Claisen
- Intramolecular aldol and Claisen reactions
- Michael reaction/ conjugate addition

Amines

- Structure, bonding, nomenclature
- Spectroscopy
- Basicity
- Preparation and reactions
- Hofmann and coupling reactions